

CLAIMS

WE CLAIM:

- 1 1. A process for extracting a borane compound from a separation medium and
2 oxidizing said borane compound, the process comprising contacting the separation
3 medium with a regeneration solution comprising at least one compound of the
4 formula $R_1\text{-CO-R}_2$, wherein R_1 is selected from hydrogen or an alkyl group having
5 from 1 to about 6 carbon atoms and wherein R_2 is selected from an alkyl group having
6 from 1 to about 6 carbon atoms, and at least one diluent.
- 1 2. The process of claim 1 wherein said at least one compound of the formula $R_1\text{-}$
2 CO-R_2 is a ketone.
- 1 3. The process of claim 2 wherein said ketone is selected from the group
2 consisting of acetone, dihydroxyacetone, fructose, dextrose, sucrose and mixtures
3 thereof.
- 1 4. The process of claim 1 wherein said at least one compound of the formula $R_1\text{-}$
2 CO-R_2 is an aldehyde.
- 1 5. The process of claim 4 wherein said aldehyde is selected from the group
2 consisting of formaldehyde, acetaldehyde, glyoxal, glyoxylic acid and mixtures
3 thereof.
- 1 6. The process of claim 1 wherein said at least one compound of the formula $R_1\text{-}$
2 CO-R_2 is present in an amount from about 10 to about 50 percent by volume and
3 wherein said diluent is present in an amount from about 50 to about 90 percent by
4 volume.
- 1 7. The process of claim 6 wherein said at least one compound of the formula $R_1\text{-}$
2 CO-R_2 is present in an amount from about 25 to about 50 percent by volume and

3 wherein said diluent is present in an amount from about 75 to about 50 percent by
4 volume.

1 8. The process of claim 7 wherein said at least one compound of the formula R_1-
2 $CO-R_2$ is present in an amount of about 50 percent by volume and wherein said
3 diluent is present in an amount of about 50 percent by volume.

1 9. The process of claim 2 wherein said diluent comprises at least one alcohol.

1 10. The process of claim 9 wherein said alcohol is selected from the group
2 consisting of methanol, ethanol, n-propanol, isopropanol, ethylene glycol, propylene
3 glycol, glycerol, and mixtures thereof.

1 11. The process of claim 11 wherein said ketone is acetone and said alcohol is
2 isopropanol.

1 12. The process of claim 11 wherein said acetone is present in an amount from
2 about 10 to about 50 percent by volume and wherein said isopropanol is present in an
3 amount from about 50 to about 90 percent by volume.

1 13. The process of claim 11 wherein said acetone is present in an amount from
2 about 25 to about 50 percent by volume and wherein said isopropanol is present in an
3 amount from about 75 to about 50 percent by volume.

1 14. The process of claim 13 wherein said acetone is present in an amount of about
2 50 percent by volume and wherein said isopropanol is present in an amount of about
3 50 percent by volume.

15. The process of claim 1 wherein said separation medium is an adsorption resin.

5 16. The process of claim 1 wherein the diluent includes at least one alcohol and
water.

17. The process of claim 16 wherein said at least one compound of the formula $R_1\text{-CO-R}_2$ is present in an amount from about 40 to about 45 percent by volume, wherein the alcohol is present in amount from about 40 to about 45 percent by volume and wherein water is present in amount from about 5 to about 20 percent by volume.

5 18. The process of claim 17 wherein said at least one compound of the formula $R_1\text{-CO-R}_2$ is present in an amount of about 45 percent by volume, wherein the alcohol is present in amount of about 45 percent by volume and wherein water is present in amount from of about 10 percent by volume.

10 19. The process of claim 17 wherein said at least one compound of the formula $R_1\text{-CO-R}_2$ is a ketone selected from the group consisting of acetone, dihydroxyacetone, fructose, dextrose, sucrose and mixtures thereof, or an aldehyde selected from the group consisting of formaldehyde, acetaldehyde, glyoxal, glyoxylic acid and mixtures thereof.

15 20. The process of claim 17 wherein said alcohol is selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, ethylene glycol, propylene glycol, glycerol, and mixtures thereof.

20 21. The process of claim 20 wherein said at least one compound of the formula $R_1\text{-CO-R}_2$ is a ketone and said ketone is present in an amount of about 45 percent by volume, wherein said alcohol is isopropanol and said isopropanol is present in amount of about 45 percent by volume, and wherein water is present in amount from of about 10 percent by volume.

22. The process of claim 2 wherein the borane compound is dimethylamine borane.

25 23. The process of claim 22 wherein said at least one compound of the formula $R_1\text{-CO-R}_2$ is acetone and wherein said diluent is isopropanol.

1 24. The process of claim 23 wherein the of said acetone present in the solution is
2 10 percent by volume and wherein the amount of isopropanol in the solution is 90
3 percent by volume.

1 25. The process of claim 23 wherein the of said acetone present in the solution is
2 50 percent by volume and wherein the amount of isopropanol in the solution is 50
3 percent by volume.

1 26. The process of claim 22 wherein said at least one compound of the formula
2 $R_1\text{-CO-R}_2$ is acetone and wherein said diluent is water.

1 27. The process of claim 26 wherein the of said acetone present in the solution is
2 10 percent by volume and wherein the amount of water in the solution is 90 percent
3 by volume.

1 28. The process of claim 22 wherein said at least one compound of the formula
2 $R_1\text{-CO-R}_2$ is acetone and wherein said diluent is a mixture of isopropanol and water.

1 29. The process of claim 28 wherein the of said acetone present in the solution is
2 45 percent by volume, wherein the amount of isopropanol in the solution is 45 percent
3 by volume, and wherein the amount of water present in the solution 10 percent by
4 volume.